

	XML Schema1	Int	Float	XML Schema2	String
	Column 1	Column 2	Column 3	Column 4	Column 5
Row 1	XML Instance 1	1	0.1746	XML Instance a	"storage"
Row 2	XML Instance 2	7	0.23232	XML Instance b	"of"
Row 3	XML Instance 3	3	0.14159	XML Instance c	"strings"

A RELATIONAL DATABASE STORING XML INSTANCES

FIGURE 1 - Prior Art

<i>namespace URI</i>	201
"http://www.microsoft.com/xquery"	210
"	220
"foo"	230

SQL XML Schema Collection Identifier DB.RelSch.foo

FIGURE 2

301

310

CREATE XML SCHEMA COLLECTION <SqlID> AS <expression> [<expression>...]

FIGURE 3

402

1. **CREATE XML SCHEMA COLLECTION** msSqlID1 **AS**

401

```
'<scheman xmlns="http://www.w3.org/2000/10/XMLSchema" targetNamespace="http://
www.w3.org/namespace/">
<element name="TOP">
<complexType>
<attribute name="name" type="string" use="required" />
<attribute name="value" use="default" value="no">
<simpleType>
<restriction base="string">
<enumeration value="yes" />
<enumeration value="no" />
</restriction>
</simpleType>
</attribute>
</complexType>
</element>
</schema>'
```

403
Schema
Components

FIGURE 4

```
<include  
  id = ID  
  schemaLocation = anyURI  
  {any attributes with non-schema  
  namespace . . .}>  
  Content: (annotation?)  
</include>
```

501

FIGURE 5

```
<redefine  
  id = ID  
  schemaLocation = anyURI  
  {any attributes with non-schema namespace . . .}>  
  Content: (annotation | (simpleType | complexType | group |  
  attributeGroup))*  
</redefine>
```

FIGURE 6

```
<import  
  id = ID  
  namespace = anyURI  
  schemaLocation = anyURI  
  {any attributes with non-schema namespace . . .}>  
  Content: (annotation?)  
</import>
```

701

FIGURE 7

1. **ALTER XML SCHEMA COLLECTION** msSqlID1 **ADD** '<scheman xmlns="http://www.w3.org/2000/10/XMLSchema" targetNamespace="http://www.w3.org/namespace/">
<element name="BOTTOM">
<complexType>
<attribute name="name" type="string" use="required" />
<attribute name="value" use="default" value="no">
<simpleType>
<restriction base="string">
<enumeration value="yes" />
<enumeration value="no" />
</restriction>
</simpleType>
</attribute>
</complexType>
</element>
</schema>'

810

820

802

801

FIGURE 8

ALTER TABLE <table_name> 910
ALTER COLUMN <column_name> XML [(<SqlID>)] [NULL | NOT NULL] 901
920

FIGURE 9

ALTER TABLE products 1010
ALTER COLUMN manufacturing_steps XML (msSqlID1) NOT NULL 1020
1001

FIGURE 10

ALTER TABLE products 1110
ALTER COLUMN manufacturing_steps XML NULL 1101

FIGURE 11

```
DROP INDEX xml_index ON products
ALTER TABLE products
ALTER COLUMN manifest (msSqlID2) XML -- this retypes the column
CREATE XML INDEX xml_index ON products (manifest)
```

1220 points to `DROP INDEX`
1210 points to `xml_index`
1230 points to `ALTER COLUMN`
1201 points to `CREATE XML INDEX`

FIGURE 12

1. xml = <http://www.w3.org/XML/1998/namespace>
2. xs = <http://www.w3.org/2001/XMLSchema>
3. xsi = <http://www.w3.org/2001/XMLSchema-instance>
4. fn = <http://www.w3.org/2002/11/xquery-functions>
5. xdt = <http://www.w3.org/2003/02/xquery-datatypes>

FIGURE 13

```
sql = urn:schemas-microsoft-com:xml-sql
sqltypes = http://schemas.microsoft.com/sql/2002/types
```

FIGURE 14

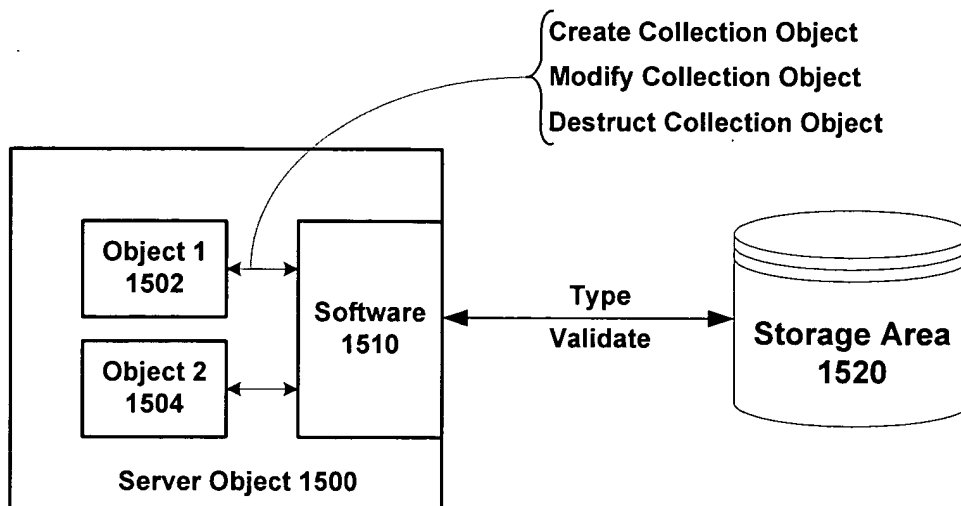
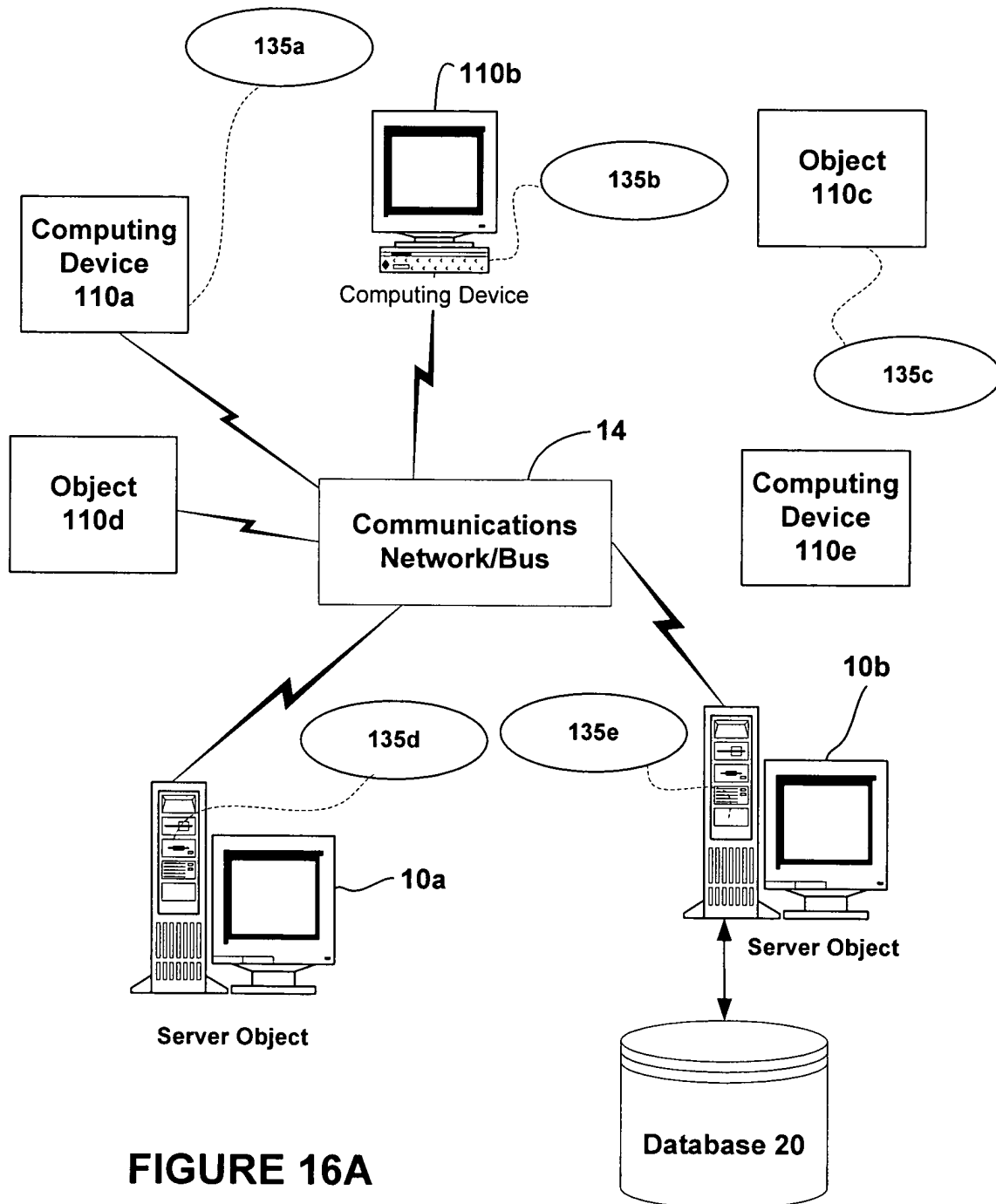


FIGURE 15A

	XML Schema Collection Object	Int	Float	XML Schema2	String
	Column 1	Column 2	Column 3	Column 4	Column 5
Row 1	XML Instance 1	1	0.1746	XML Instance a	"storage"
Row 2	XML Instance b	7	0.23232	XML Instance b	"of"
Row 3	XML Instance c	3	0.14159	XML Instance c	"strings"

FIGURE 15B



Computing Environment 100

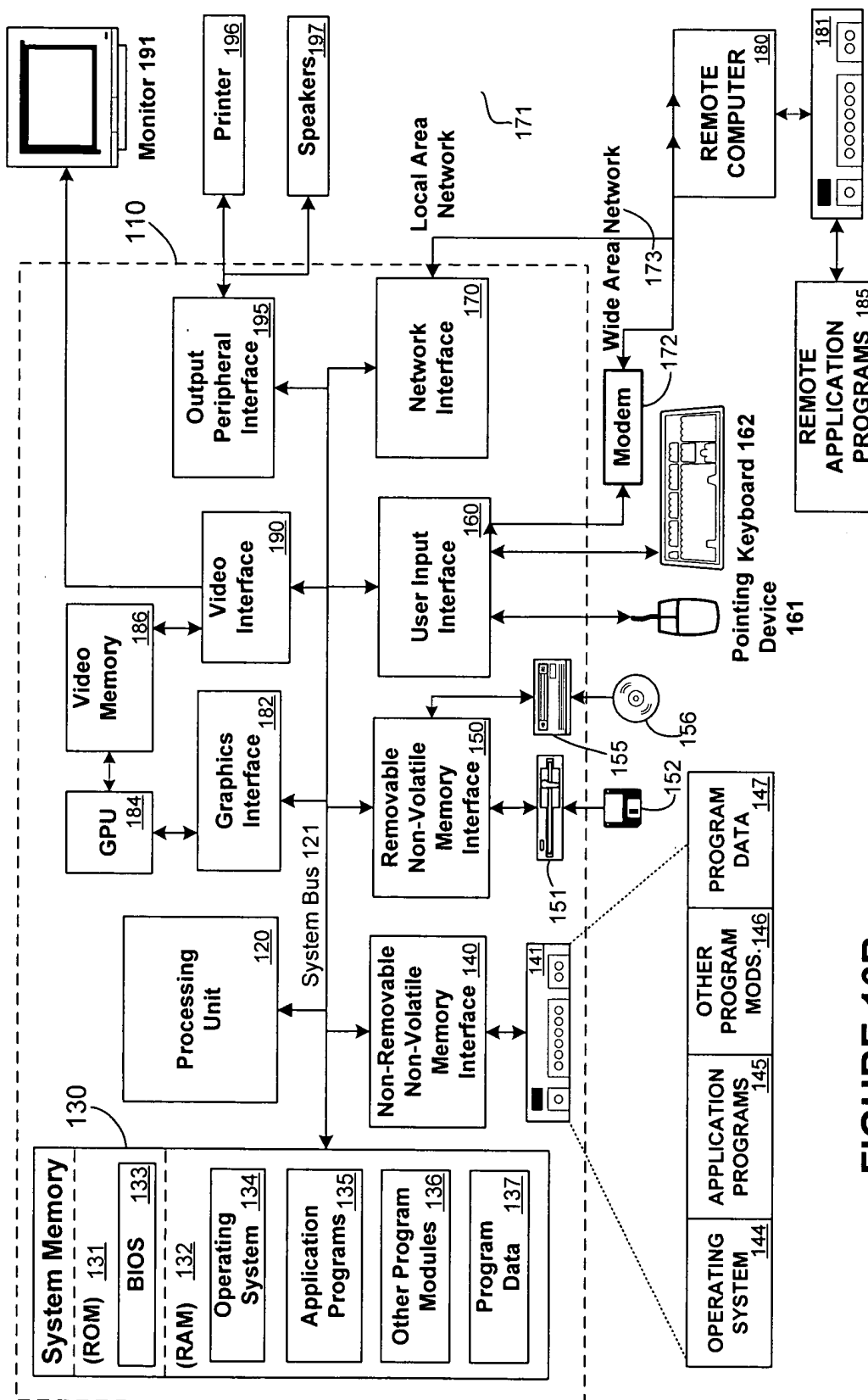


FIGURE 16B

Computing Environment 100

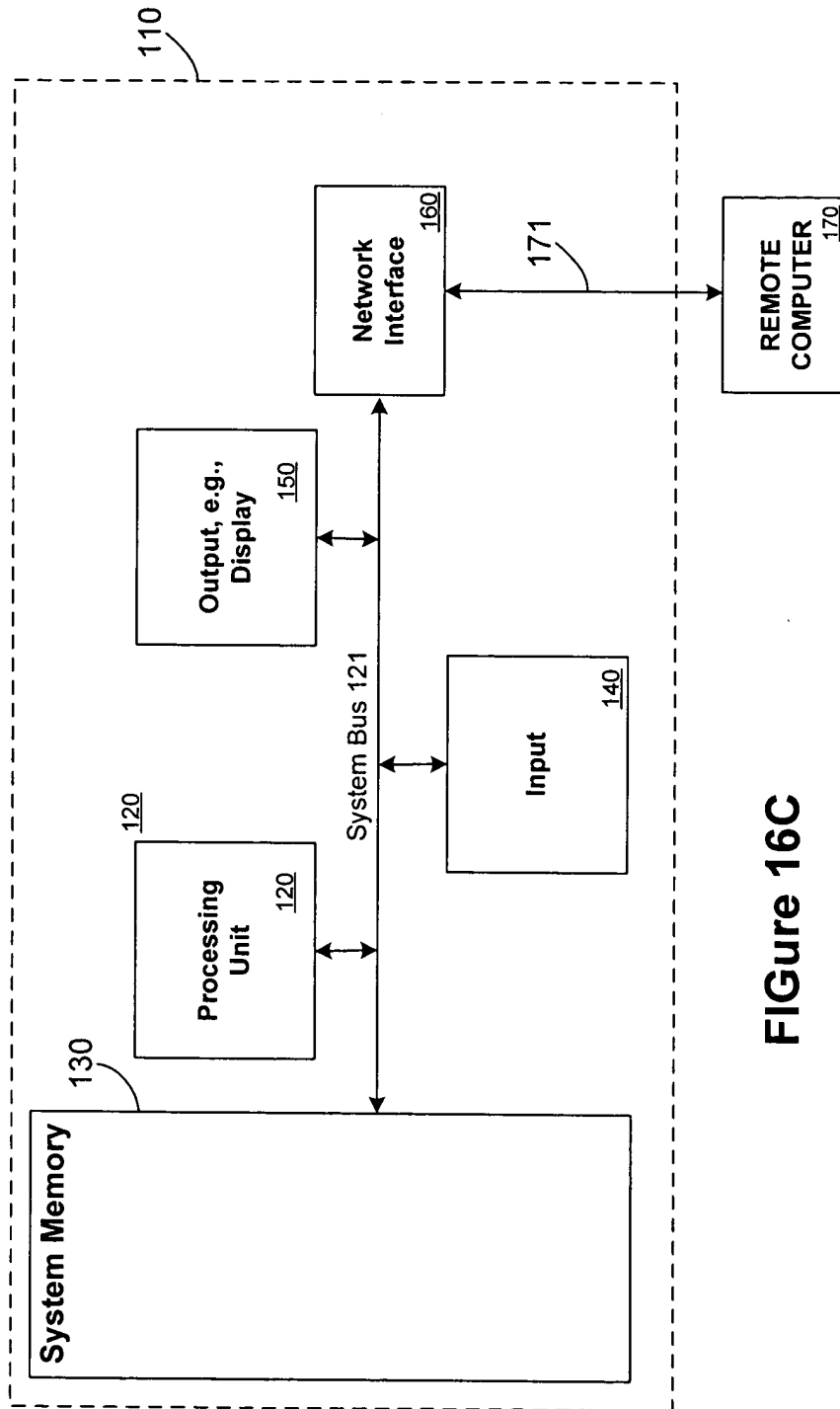


FIGURE 16C